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DETECTION AND IDENTIFICATION OF MYCOPLASMA INFECTIONS OF CELL CULTURES BY DNA HYBRIDIZATION

Leningrad TSITOLOGIYA in Russian Vol 29, No 8, Aug 87 (manuscript received 25 Jun 86) pp 934-941

[Article by S.N. Borkhsenius, O.A. Chernova, N.A. Merkulova and A.F. Are, Institute of Cytology, USSR Academy of Sciences, Leningrad]

[Abstract] DNA hybridization was performed on cell cultures to assess this technique for the detection of contamination with mycoplasma and identification of the involved species. The recombinant plasmids used as probes contained fragments of mycoplasmal DNA and the rrnB ribosomal RNA operon of E. coli. Using the Southern blot technique the method was successful in the identification of M. arginini, M. hominis, M. gallisepticum, and A. laidlawaii. In addition, a recombinant plasmid (pMg16) was designed that contained rRNA genes of M. gallisepticum and served as a universal probe for mycoplasmal contamination of eukaryotic cell cultures. The sensitivity of the method when using P-32-labeled probes in nick translation and autoradiography was on the order of 1 ng of mycoplasmal DNA, which corresponded to approximately 10^6 mycoplasmal particles. Figures 3; tables 1; references 29: 3 Russian, 26 Western.

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NOVEL INTERMEDIATE IN BACTERIORHODOPSIN PHOTOCYCLE RESPONSIBLE FOR PROTON UPTAKE FROM MEDIUM

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 4, No 8, Aug 87 (manuscript received 12 Dec 86) pp 831-837

[Article by A.D. Kaulen and V.V. Zorina, Moscow State University imeni M.V. Lomonosov, Interdepartmental Problematic Scientific Research Laboratory of Molecular Biology and bioorganic Chemistry imeni A.N. Belozerskiy]

[Abstract] In spite of intensive study, the stoichiometry of H^+ transport by bacteriorhodopsin and the connection of the photocycle reactions with transmembrane H^+ transfer processes have not been fully explained. In previous work it was shown that the decreased amplitude of light-sensitive pH changes in a suspension of purple membranes during proteolytic cleavage of the C-terminal fragment of bacteriorhodopsin is caused by increased aggregation of purple membranes. Such aggregates can be broken up by Triton X-100 leading to many changes in the kinetics of photocycle and pH responses. In this paper these changes were analyzed, and it was concluded that a new intermediate called P (pseudobacteriorhodopsin) must exist in the bacteriorhodopsin (bR) photocycle. The transition from P to bR correlated with proton uptake from the medium. The absorption spectrum of P differed from that of bR in the range of 560-570 nm and below 460 nm. the transition between the intermediate M and P correlated with protonation of the Schiff base, the proton being transferred from a protein involved in the inward H^+ conductivity pathway. Only one H^+ is transported per bR photocycle and the cis-trans isomerization in darkness occurs after the P converts totally to bR. Figures 5; references 19: 4 Russian, 15 Western (3 by Russian authors).

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INVESTIGATION OF ERYTHROCYTE MEMBRANE PERMEABILITY DURING FREEZING AND THAWING IN A MEDIUM OF NON-PENETRATING AND PENETRATING CRYOPROTECTOR

Kiev KRIOBIOLOGIYA in Russian No 3, Jul-Sep 87 (manuscript received 11 Oct 86) pp 15-19

[Article by A.K. Gulevskiy and O.A. Nardid, Institute of Cryobiology and Cryomedicine Problems, UkSSR Academy of Sciences, Kharkov]

[Abstract] In earlier studies it was shown that under extreme conditions (hypertonic solutions, dessication, strong electric fields) plasma membranes are permeable to molecules to which they are impermeable under normal conditions. In the present study it was shown that freezing-thawing of erythrocytes in the presence of the non-penetrating cryoprotector polyethylene oxide leads to reversible disturbance of plasma membrane barrier properties towards K^+, Na^+, ^{45}Ca, Mn^{++} and ^{14}C-sucrose. The level of K^+ in the cells decreases 3.2-fold while that of Na^+ is increased 3.8-fold. Exposure to these cryoprotectors without a freeze-thaw cycle has no effect on this exchange. Evidently, cell freezing in the presence of nonpenetrating cryoprotectors initiates formation of transmembrane defects which undergo "self repair" during the warming process. Figures 2; references 9: 4 Russian, 5 Western.

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CRYOPROTECTIVE PROPERTIES OF ETHYLENE GLYCOL ETHERS DURING FREEZING OF HUMAN ERYTHROCYTES

Kiev KRIOBIOLOGIYA in Russian No 3, Jul-Sep 87 (manuscript received 10 Nov 85) pp 32-34

[Article by A.M. Vorotilin, A.M. Miroshnikov, V.M. Guchok and V.D. Zinchenko Institute of Cryobiology and Cryomedicine Problems UkSSR Academy of Sciences, Kharkov and Production Association "Khimprom", Kemerovo]

[Abstract] Cryoprotective properties of monoethyl ethers of mono-, di- and triethylene glycol as well as the monomethyl ether of diethylene glycol were investigated using human erythrocytes. The concentration of cryoprotectors and the rate of freezing were varied. It was shown that the least degree of hemolysis was observed with a moderate freezing rate (14-24° C/min) and a 30-40% concentration of the cryoprotectant. The methyl ether of diethylene glycol was comparable to propylene glycol and superior to ethylene glycol as a cryoprotectant. The cryoprotective action of the other agents studied was considerably poorer. Figure 1; references 7: 6 Russian, 1 Western.

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IMPORTANCE OF BIOTECHNOLOGY AND PROBLEMS ATTENDANT TO ITS DEVELOPMENT

Kiev VISNYK AKADEMIYI NAUK UKRAYINSKOYI RSR in Ukrainian No 7, Jul 87 pp 16-19

[Speech given by F.S. Babicheva, Vice President of the UkSSR Academy of Science, Academician, at the general meeting of the UkSSR Academy of Sciences]

[Abstract] Intensive development of biotechnology in other parts of the world has not had its counterpart in the Ukraine, although biotechnology is one of the five highest priorities of the COMECON countries. The situation is particularly serious when it comes to genetic engineering, and can be attributed to material, financial, and staffing difficulties. However, definite steps have already been taken to rectify this state of affairs, with the establishment of the Ukrainian "Biotekhnolohiya" program that involves 16 institutes of the Ukrainian Academy of Sciences, as well as corresponding institutes in other Soviet republics. The immediate goals are to develop and implement some twenty biotechnologies in the fields of medicine, agriculture, and industry. With the support of the UkSSR Council of Ministers, the Academy has laid plans for establishing biotechnology research centers at the Institute of Molecular Biology and Genetics and the Institute of Botany, as well as a hybridoma center at Glavakha. In addition, plans have been made to enable young specialists to travel to COMECON and capitalist countries for advanced training in biotechnology and genetic engineering.

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POTENTIAL USE OF BIOTECHNOLOGICAL CONSTRUCTION OF PLANT CELLS

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 3, May-Jun 87 (manuscript received 4 Feb 87) pp 296-301

[Article by R.G. Butenko, Institute of Plant Physiology, USSR Academy of Sciences, Moscow]

[Abstract] Controlled construction of plant cells with specific properties to produce various cell lines and plants with valuable agricultural characteristics has captured the imagination of many scientists. Various approaches to such plant cell construction are reviewed in this paper. Viable wheat protoplasts were isolated at the Institute of Molecular Biology, Kazakh SSR Academy of Sciences in collaboration with the author's group. Experiments have been planned to fuse them with wild strain wheat protoplasts to develop new sorts with better properties. Unfortunately at present there are no methods available to control subsequent events at the level of unorganized multiplication of reconstituted cells or cell divisions leading to morphogenesis. Figures 2; references 18: 9 Russian, 9 Western (4 by Russian authors).

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LIVE RECOMBINANT VACCINES--NEW DIRECTION IN BIOTECHNOLOGY

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 3, May-Jun 87 (manuscript received 4 Feb 87) pp 302-306

[Article by I.I. Fodor, V.I. Chernos, K.A. Bendukidze and A.D. Altshteyn, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino; Scientific Research Institute of Viral Preparations, USSR Ministry of Health, Moscow; Scientific Production Organization "Biotekhnologiya", Moscow and Institute of General Genetics, USSR Academy of Sciences, Moscow]

[Abstract] A review of methods for production of recombinant vaccines is presented, with emphasis on a smallpox-hepatitis vaccine strain suitable for many clinical, veterinary and epidemiological studies. Recombinant smallpox vaccines containing pathogen antigens induce heterologous antigens in vaccinated animals which are transported to cell surfaces and evoke immunity (the only exception is the hepatitis-smallpox vaccine). The principal source of rabies in Europe are foxes; wild foxes could be immunized by feeding them meat containing the smallpox-rabies vaccine. Other veterinary applications are also possible. Recombinant smallpox vaccines are being considered for the prevention of AIDS. Polyvalent recombinant smallpox vaccines which confer immunity to several diseases simultaneously are possible, due to the large vector capacity (25 thousand base pairs) of the smallpox vaccine. Figure 1; references 11: 1 Russian, 10 Western (1 by Russian author).

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SYNTHESIS OF VIRAL SURFACE ANTIGENS IN YEASTS

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 3, May-Jun 87 (manuscript received 4 Feb 87) pp 319-324

[Article by M.A. Eldarov, S.P. Morzunov, I.V. Karpychev, K.G. Skryabin, O.V. Vasilenko, P.M. Sveshnikov, Ye.S. Severin, Z. Brantl, Kh. Lang, Kh. Rossler and Z. Rozental, Institute of Molecular Biology, USSR Academy of Sciences, Moscow: Central Institute of Microbiology and Experimental Therapy, GDR Academy of Sciences, Jena and Central Institute of Molecular Biology, GDR Academy of Sciences, Berlin]

[Abstract] Recombinant DNA technology can be used effectively in preparing safe and simple vaccines and diagnostic kits. The goal of this work was to obtain yeast strains capable of synthesizing human hepatitis B viral surface antigen and bovine leukemia virus (BLV) envelope protein. Analysis of the expression of various HBsAg gene variants of the hepatitis B virus in saccharomycetes cells controlled by regulatory sequences of yeast genes was carried out. Comparative analysis shed light on the effectiveness of various promoters and showed the significant influence of the 5'-terminus in mRNA on the synthesis of heterologous protein in yeast. Expression of BLV gp51 gene in yeast was examined and the immunologic properties of the synthesized protein were studied. Denaturation of viral gp51 completely removed its ability to react with antibodies against epitopes C, F, G, H while retaining reactivity towards A, B/B', D/D' and E epitopes. Figures 6; references 22: 4 Russian, 18 Western.

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MYCOPLASMAS AS OBJECTS OF BIOTECHNOLOGY

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 3, May-Jun 87 (manuscript received 4 Feb 87) pp 338-342

[Article by S.N. Borkhsenius, Institute of Cytology, USSR Academy of Sciences, Leningrad]

[Abstract] General characteristics of mycoplasmas are reviewed. They are placed somewhere between viruses and bacteria. Most of them are symbionts and facultative parasites of fish, mammals, insects and plants, many of them being pathogenic. One study showed them to be weak immunogens. They contaminate cells and tissues cultivated in vitro. Two aspects of biotechnology with respect to mycoplasmas were considered in greater detail: 1) the use of DNA hybridization probes based on recombinant plasmids for diagnosis of mycoplasmoses and monoclonal antibodies for diagnosis and suppression of pathogenic mycoplasms, and 2) the possibility of using enzymes, membranes, plasmids and viruses of mycoplasmas as biotechnological tools. References 18: 8 Russian, 10 Western.

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NEW SYSTEMS OF GENETIC TRANSFORMATION OF SOMATIC MAMMALIAN CELLS

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 3, May-Jun 87 (manuscript received 4 Feb 87) pp 343-351

[Article by N.V. Tomilin, Institute of Cytology, USSR Academy of Sciences, Leningrad]

[Abstract] In recent years, genetic transformation has become one of the more important instruments in studying mammalian gene expression, mechanisms of malignant transformation, DNA replication and recombination processes and in the production of genetically engineered products. Some new methods for DNA insertion and selection of stable transformants are discussed. Significant improvement of the calcium phosphate procedure was achieved by addition of sodium butyrate immediately after glycerin shock, which increased DNA penetration into cells 4-fold and transcription of inserted DNA 30-fold. Considerable progress has been made in the use of amplified and autonomous vectors such as BPV (bovine papilloma virus). However, because of the high frequency of mutagenesis during autonomous replication, it cannot yet be used widely. Retroviral vectors were developed recently which can be used in gene therapy, as was shown by transferring the adenine desaminase gene into cells of human and murine bone marrow. Effective gene transfer into stem cells can also be achieved by calcium-phosphate method using in vivo selection. Another direction in this field is the addressed integration of foreign genes into specific sites on the chromosomes, which require homologous recombination between chromosomal and plasmid genes. This technique is still undeveloped because homologous recombination is rather rare, requiring strict selection of stem cell clones. Figures 3; references 59: 3 Russian, 56 Western.

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PSEUDOMONAS AERUGINOSA RESTRICTASES; PHYSIOCHEMICAL PROPERTIES, SUBSTRATE SPECIFICITY, POTENTIAL UTILIZATION

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 5, Sep-Oct 87 (manuscript received 5 May 86) pp 578-585

[Article by N.N. Sokolov, A.B. Fitsner, N.V. Anikeycheva, O.T. Samko, E.B. Khoroshutina, V.O. Kolosha and I.I. Fodor, Scientific Research Institute of Medical Enzymology, USSR Academy of Medical Sciences, Moscow; Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast]

[Abstract] The physiochemical properties, specificity of action and potential use of two restrictases Pae I and Pae II in genetic engineering were described. These restrictases were isolated using ultrasound cell destruction, fractionation with polyethyleneimine and ammonium sulfate, and column chromatography followed by dialysis against a buffer of potassium phosphate, Triton X-100, 2-mercaptoethanol and glycerin at pH 7.4. The products were practically free of non-specific endo- and exonucleases. Pae II showed K^+-dependent activity, its optimum being between 20 and 60 mM K^+. The optimum pH was 7.7-8.0 for Pae I and 6.6-7.5 for Pae II and the optimum temperature ranges were 37-45 and 30-37^{o}C, respectively. The optimal concentration of divalent cations (Mn^{++}, Ca^{++} and Mg^{++}) was 5-10 mM. The molecular weight was determined to be 150 and 130 kD for Pae I and Pae II, respectively. Based on the data of substrate specificity and the structure of the recognition site, Pae I and Pae II appeared to be isoschizomers of restrictases Sph I and Sma I, respectively. Figures 4; references 20: 7 Russian (1 by Western author), 13 Western (2 by Russian authors).

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ENZYME IMMOBILIZATION WITHIN FIBER AND FILM STRUCTURES DURING THEIR FORMATION. I. IMMOBILIZATION OF NONMODIFIED ENZYMES

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 5, Sep-Oct 87 (manuscript received 17 Jul 86) pp 602-611

[Article by A.D. Virnik, N.R. Kildeyeva, S.B. Krasovskaya, L.V. Vodolazskaya, Z.G. Solomon and B.L. Biber, Scientific Production Organization "Khimvolokno", Moscow Oblast, Moscow Textile Institute]

[Abstract] Immobilized enzymes are used widely in production, research and medical applications. One of the most promising methods of immobilization is the inclusion of such enzymes in the structure of films and fibers during the formation of the latter. the method is simple, does not require modification of the polymer carrier or of the equipment used for their production. The quantity of enzyme can be varied substantially and even impure materials can be effectively immobilized. A review of the literature is presented concentrating on the type of materials used for production of films and fibers and the effect of the composition of weaving solutions, conditions of their preparation and structure of the biocatalyst produced on the properties of immobilized enzymes. References 44: 28 Russian (6 by Western authors) 16 Western.

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DOUBLE IMMOBILIZATION OF ENZYMES IN INORGANIC MATRICES

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 5, Sep-Oct 87 (manuscript received 8 Jul 86) pp 612-617

[Article by G.A. Kovalenko and V.D. Sokolovskiy, Institute of Catalysis, Siberian Department of USSR Academy of Sciences, Novosibirsk]

[Abstract] The principle of "double immobilization" can be described as follows: an enzyme already absorbed on an appropriate carrier is entrapped in a gel or polymerization of the gel with inclusion of enzymes is performed in the presence of solid absorbent or filler. Materials obtained represent a porous gel-like mass reinforced with an inorganic skeleton which increases its mechanical strength and improves its hydrodynamic properties. In the present paper, a method of double immobilization is described using a totally inorganic matrix which provides a simple, inexpensive preparation method for biocatalysts (aluminum oxide, silica gel). In this method protein globules are sealed in the pores of the gel and the porous structure of the carrier. These preparations combine the advantages of being immobilized on an inorganic carrier (strength, low hydrodynamic resistance, skeleton rigidity) with those of gel immobilization where high catalytic activity and stability are maintained. The entrapment process occurs under mild conditions, neutral pH, room temperature, in the absence of free radical reaction initiators, etc. Thus, it is applicable to a variety of enzymes: alcohol dehydrogenase, glucose oxidase or alkaline proteinase. Figures 2; references 10: 7 Russian (4 by Western authors), 3 Western.

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IMMOBILIZATION OF NUCLEIC ACIDS USING GLUTARYL ALDEHYDE

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 5, Sep-Oct 87 (manuscript received 8 Jul 86) pp 618-623

[Article by V.V. Romanov and V.K. Starostina, Scientific Research, Design and Logical Institute of Biologically Active Substances, Novosibirsk Oblast]

[Abstract] The goal of this study was to develop a method for immobilization of nucleic acids on a cellulose matrix using glutaryl aldehyde as a binding agent. The procedure involves the following steps: aminoethyl cellulose is dried on a glass filter, suspended and added to a solution of denatured DNA (or RNA) previously heated to 96° C. This mixture is heated in a water bath for 15-30 min with stirring. After the sorption has reached 80-90%, glutaryl aldehyde is added and the mixture is incubated for another 10-15 min. Then it is cooled, filtered, washed with 1 M NaCl and finally with water. Thus immobilized single- and double-stranded nucleic acids should be stable to the action of nucleases. The yield of immobilized preparation of denatured DNA (RNA) with a ligand to matrix ratio of 600 to 3600 optical density units per gram is 72-98% and that of the native DNA (ratio of 530 optical units per gram) is 60%. The method is simple and rapid, providing preparations with a high content of ligands which are stable to the action of nucleases. Figures 4; references 15: 7 Russian, 8 Western.

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BICENTRIC ENZYME IMMUNOASSAY OF SPECIFIC ANTIGENS BASED ON COLUMN IMMUNOSORPTION CHROMATOGRAPHY

Moscow BIOTEKHNOLOGIYA in Russian Vol 3, No 5, Sep-Oct 87 (manuscript received 7 May 87) pp 624-626

[Article by V.P. Chekhonin and G.V. Morozov, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V.P. Serbskiy, Moscow]

[Abstract] The goal of this work was to develop a highly sensitive bicentric enzyme immunoassay for specific alpha-1 and alpha-2 globulins of human brain using column immunoabsorption chromatography CNBr-Sepharose 4B with immobilized $F(ab)_2$ fragments of asinine antibodies to rabbit IgG). Antisera to these brain globulins (α_1M and α_2M) were obtained by immunizing sheep with purified preparations of these antigens. Specific brain antigens could be determined in the concentration range of 0.15 to 9.6 ng/ml, and the method was tested on healthy volunteers, patients with pancreatitis or peritonitis as well as some with psychological disorders. Specific α_1M was observed in the blood serum of 60% of patients with febrite schizophrenia, 50% of patients with acute alcoholic encephalopathy and 66% of patients with severe neurolepsia. Specific α_2M was detected in 45% of patients with febrite schizophrenia, 30% of those with acute alcoholic encephalopathy and 40% of those with severe neurolepsia. Figure 1; references 12: 3 Russian, 9 Western.

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IMPROVEMENTS IN EFFICIENCY OF SHIPBOARD CONTROL SYSTEMS WITH HUMAN OPERATORS

Leningrad SUDOSTROYENIYE in Russian No 8, Aug 87 pp 26-27

[Article] A mathematical analysis was performed on man-machine interaction in shipboard control systems, to assess the 'human factor' in planning automatic control systems for large vessels. The function of the human operator was reduced to procedures involved in the selection and processing of ship movement-determining information. Analysis of theoretical and observational data demonstrated that manual control of ship movements was below optimum quality, with the probability of error increasing at the lower speeds. The performance and efficiency of ship management was markedly improved by information support system that minimized dispersion and approximated expectation and probability of an event. Figure 2; tables 2; references 4 (Russian).

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MORPHOFUNCTIONAL ASSESSMENT OF IMMUNOGENIC POTENCY OF LIVE BRUCELLOSIS VACCINE

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 87 (manuscript received 19 Oct 86) pp 44-47

[Article by Yu.V. Solodun, I.I. Osipenko, R.G. Skvortsova and L.P. Repina, All-Union Scientific surgical Center, Siberian Branch, USSR Academy of Medical Sciences; Scientific Research Antiplague Institute of Siberia and the Far East, Irkutsk]

[Abstract] A study of immunogenic potency of live brucellosis vaccine from Brucella abortus BA-19 strain included complex investigation and careful elaboration of individual mechanisms of immunogenesis. Immunocompetent organs were studied, in 65 guinea pigs, from 1-30 days after vaccination by a 5.10^9 microbial cell dose of the live vaccine in the left thigh. Homogenates and cryostatic sections 5-7 μm thick were prepared from lymph nodes and spleen. Induction of immunogenesis by the vaccine strain, shown in the dynamics of the vaccinal process, was used to assess the immunogenic potency of this vaccine. Morphometry and quantitative assessment of globulins of producer cells in the lymphoid organs by use of direct and indirect methods of immunofluorescence with antisera and a marker method with assessment of lymphocyte classes according to acid and alkaline phosphatases were used in the evaluations. Indicators of cell electrophoresis of T- and B-lymphocytes and lymph node and spleen homogenates revealed activation of T-helpers in the beginning of the secretory phase of immunogenic potency of the vaccine. The immunoperoxidase method used to reveal the antigen together with the opsonophagocytic index characterized the state of phagocytosis and the elimination of the antigen. Reference 8: 3 Russian; 5 Western.

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EXPERIMENTAL STUDY OF PROTECTIVE ACTIVITY OF VACCINES PRODUCED FROM EVEN PSEUDOMONAS AERUGINOSA IMMUNOTYPES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 87 (manuscript received 21 Jun 86) pp 47-50

[Article by Ye.V. Kholodkova, Yu.M. Fedotova and Ye.S. Stanislavskiy, Central Scientific Research Institute of Vaccines and Sera imeni I.I. Mechnikov, Moscow]

[Abstract] A study of the cross protection effectiveness of seven P. aeruginosa immunotypes involved preparation of monovaccines from seven P. aeruginosa immunotypes and three P. aeruginosa production strains belonging to immunotypes 2, 3 and 7 and study of their effect on immunized and nonimmunized mice 7 days after infection by intraperitoneal injection of 5 different doses of Pseudomonas pyocyanea. The monovaccines produced both a specific and cross protective effect. The cross protective activity was attributed to common protein antigens (or antigen) in the outer cell wall membrane. Monovaccines from immunotypes 2, 3, 4, 7 had higher immunogenic potency than those from immunotypes 1, 5 and 6 after infection by homologous strains. Specific protection of vaccinated mice was induced, evidently, by the O-antigen (O-polysaccharide lipopolysaccharide). Immunological relationships were established between immunotypes 3, and 7, 2 and 3 and 1 and 2 and between immunotypes 1, 5 and 7. The study showed that it is possible, during the creation of P. aeruginosa vaccine, to use several or even one strain (immunotypes), which stimulate both specific and cross protection. References 9: 3 Russian; 6 Western.

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PRODUCTION OF SPLIT AND WHOLE-VIRION TICK-BORNE ENCEPHALITIS VACCINE IN EXPERIMENT AND CHARACTERISTICS OF THEIR IMMUNOGENIC AND ANTIGENIC PROPERTIES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 87 (manuscript received 15 Jul 86) pp 50-53

[Article by Ye.G. Osipova, R.G. Solyanik, Yu.V. Fedorov and P.N. Tymchishin, Tomsk Scientific Research Institute of Vaccines and Sera]

[Abstract] A comparison of specific properties of split and whole-virion tick-borne encephalitis virus in experiments on animals was presented and discussed. Tick-borne encephalitis virus was cultivated for 64-72 hours in a suspension of 9-11 day-old chick embryo cells and purified by a sedimentation method. Treatment of purified and concentrated tick-borne encephalitis virus by Tween-80 and ether almost completely destroyed it, but active virus was isolated sometimes after passivating the material through 7-8 g white mouse brain. Active virus was not found after inactivation by formalin in a 1:10,000 concentration. Both the split and the whole-virion virus produced adequate active immunity to pathogenic tick-borne encephalitis virus in 14-16 g BALB mice. The disintegrated preparation of the virus retained antigenic and immunogenic properties after removal of the detergent. References 9: 2 Russian; 7 Western.

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REGULATION OF HUMAN LYMPHOCYTE PROLIFERATIVE AND SUPPRESSOR ACTIVITIES BY RECOMBINANT ALPHA-INTERFERON

Moscow LABORATORNOYE DELO in Russian No 9, Sep 87 (manuscript received 26 Jun 86) pp 685-688

[Article by A.N. Cheredeyev, A.A. Potapova, L.M. Chermeneva and Z.M. Levina, 2nd Moscow Medical Institute imeni N.I. Pirogov]

[Abstract] In vitro studies were conducted with lymphocytes derived from donor blood to assess the immunoregulatory effects of recombinant alpha-interferon (RAIF). Controls studies demonstrated that the donors could be classified into two categories on the basis of blast transformation as a result of lymphocyte incubation with PHA: high and low responders. Preincubation of the lymphocytes with RAIF, followed by washing to remove RAIF, and incubation with PHA attenuated the degree of blast transformation of the initially high responders, while enhancing responsiveness of the low responders. Similar RAIF immunoregulatory function was demonstrated in studies on Con A-inducted suppression. Pretreated lymphocytes from individuals showing a high control index responded with attenuation, while cells with a low control index presented with enhancement. These observations suggest that the immunoregulatory function of RAIF with respect to human lymphocytes may be of interest in the clinical setting. Figures 2; references 4: 1 Russian, 3 Western.

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EFFECTS OF HELIUM-NEON LASER ON OPPORTUNISTIC PATHOGENS

Kiev VRACHEBNOYE DELO in Russian No 8, Aug 87 (manuscript received Dec 86) pp 53-56

[Article by M.V. Shesterina, A.N. Kalyuk and B.M. Maliyev, Moscow Scientific Research Institute of Tuberculosis, RSFSR Ministry of Health]

[Abstract] The effects of a helium-neon laser (LG-75, wavelength of 0.63 micron, 20 mW output) were tested on bacterial isolates from patients with pulmonary tuberculosis, as well as on analogous strains with opportunistic potential obtained from culture collections. Irradiation of Petri dishes demonstrated that the effects were dose-dependent. In general, antibiotic susceptibility and biochemical characteristics of the opportunistic pathogens were not affected. However, growth of micrococci and Staphylococcus epidermidis was delayed for several days, and the colony size of Staphylococcus aereus was reduced, as was that of E. coli and Pseudomonas pyocyanea. In none of the cases was growth stimulation observed. References 6 (Russian).

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MECHANISM OF EFFECT OF REFLECTED HELIUM-NEON LASER RADIATION

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 4, Jul-Aug 87 (manuscript received 12 Nov 85) pp 60-64

[Article by V.V. Sokolovskiy, I.N. Ushkova, L.P. Rodionova, L.A. Pokrovskaya and Yu.D. Berezin, Department of Biochemistry (headed by professor V.V. Sokolovskiy), Central Scientific Research Laboratory (headed by L.A. Pokrovskiy), Sanitation and Hygiene Medical Institute; Laboratory of Labor Hygiene (headed by L.S. Dubeykovskaya), Scientific Research Institute of Labor and Industrial Diseases, Leningrad]

[Abstract] A study of changes of regional and systemic blood circulation of the antioxidant system under the effect of reflected laser radiation involved 2.0-2.5 kg male chinchillas, subjected to direct laser irradiation while fixed in a physiological pose. Control animals were kept under analogous conditions but not subjected to laser emission. A continuous helium-neon laser with wavelength 0.6328 μm. The daily exposure was 1.7×10^{-2} J/cm^{-2} (14 min, power flux density 2×10^{-5} W/cm^2) for 4 months. The functional state of the regional and systemic blood circulation was studied on days 5, 10, 20, 30, 60, 90 and 120 of the experiment and 30 days after the experiment. The study revealed an early response reaction of the experimental animals to the laser irradiation. Long-term irradiation produced phase changes in the level of components of the nonenzymic link of the antioxidant system. Radiation for 4 months at the threshold level increased succinate dehydrogenase activity by 60 percent and acetylcholinesterase activity by 91.3 percent. Na, K, Mg-ATPase activity increased somewhat and lactate dehydrogenase and glucose-6-phosphate dehydrogenase activity tended to decrease. In the restoration period, activation of glycolysis

and the pentose phosphate cycle occurred against a background of succinate dehydrogenase and acetylcholinesterase reduction and retention of high ATPase activity while lactate dehydrogenase and glucose-6-phosphate dehydrogenase activity increased more than 1.5-fold. The biochemical changes indicated increased nonspecific body resistance in order to maintain homeostasis. Figures 3; references: 11 Russian.

2791/12223
CSO: 18400023

NEUTRON THERAPY FOR CANCER

Moscow IZVESTIYA in Russian 14 Sep 87 p 1

[Article entitled "Neutrons Against Cancer"]

[Abstract] Remote neutron therapy for irradiating tumors by neutrons is being used successfully at Tomsk Institute of Oncology. Use of neutrons in medicine has been practiced at Kiev Radiological and Oncological Scientific Research Institute, Tomsk Oncological Institute and the Scientific Research Institute of Medical Radiology from Obninsk. The Tomsk clinic collaborated with the Scientific Research Institute of Electron Introscopy and the Scientific Research Institute of Nuclear Physics Polytechnical Institute in the search for new methods of radiation therapy. This collaboration accelerated the introduction of neutron therapy, which is now as common in the Institute of Oncology as all traditional forms of therapy. Neutron therapy is now employed in treatment of tumors of the head and neck, tumors of the bone and muscle systems and tumors which have metastasized into the lymph nodes. Neutron therapy is effective in combination with other forms of irradiation and surgery.

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HEMOSORPTION CLINICAL TESTING COMPLETED

Moscow IZVESTIYA in Russian 8 Oct 87 p 6

[Article by L. Ivchenko: "Tests of New Method of Sepsis Control Have Been Completed After Two Years"]

[Abstract] An article in IZVESTIYA "One Hour and an Entire Lifetime" (IZVESTIYA No 178, 1985) describing a unique method for purifying infected blood by use of swine spleen, which was used for the first time in the world at the Scientific Research Institute of Organ Transplantation and Artificial Organs, caused a flood of letters appealing for treatment by this method. These appeals had to be refused because of the great demand and because the method was approved only for treatment of grave sepsis. Now clinical tests have been completed and the procedure has been introduced in some cities including Leningrad, Kiev, Kharkov, Tbilisi, Tostov-on-Don, Donetsk, Sverdlovsk, Kirov, Alma-Ata and Sevastopol. The method was not approved for treatment of children because swine spleen is larger than the adult human spleen and much larger than a child's spleen. A case in which the procedure was used to cure a 12-year old Czechoslovakian boy with grave sepsis affecting the lungs, liver, kidneys and heart was described and discussed. The method has been used on patients in very critical condition after all other methods had proved to be ineffective. It has been effective in treating persons with severe pulmonary lesions and purulent infections in different locations and persons with certain urological diseases. Attempts to realize wider use of the procedure and aspects of training more physicians to use it were discussed briefly. Interest of foreign specialists in the methods and attempts to introduce it broad were discussed briefly.

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LOCAL PREVENTION OF THROMBOSIS IN CANINE CAROTID ARTERY BY MAGNETIC CONCENTRATION OF ERYTHROCYTES LOADED WITH ASPIRIN

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 8, Aug 87 (manuscript received 20 Jun 86) pp 153-155

[Article by A.N. Orekhov, A.A. Belyayev, N.M. Orekhova, G.P. Samokhin, S.E. Ragimov, S.A. Rudchenko and R.S. Akchurin, All-Union Cardiological Research Center, USSR Academy of Medical Science, Moscow]

[Abstract] Magnetic erythrocytes loaded with aspirin were used in an attempt to prevent formation of thrombosis in canine carotid artery by concentrating them at a specific site by means of a small external magnet. Thrombosis was induced by means of a vascular wall flap inversion into the lumena. Within 4-5 hrs a thrombus was formed. Animals without magnetized erythrocytes loaded with aspirin or erythrocytes without aspirin exhibited a gradual drop in blood circulation which reached zero in 4-5 hrs. In contrast, animals which were injected with magnetized erythrocytes loaded with aspirin, after an initial drop, showed a gradual return of blood circulation to normal level. The principal advantage of this method is the ability to use much lower doses of the necessary drug at a specific site. Figures 2; references 4: 2 Russian, 2 Western.

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UDC 615.919:579.852.13].015.4

EXPERIMENTAL CHARACTERISTICS OF ANTHRAX INTOXICATION

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 87 (manuscript received 20 Oct 86) pp 98-101

[Article by V.S. Kolesnik, E.Ye. Tafelshteyn, R.,S. Kolesnik, T.P. Starovoytova and A.M. Kondratyeva, Scientific Antiplague Research Institute of Siberia and the Far East, Irkutsk]

[Abstract] The pathogenesis of anthrax intoxication was studied on white Fischer-344 rats; the animals were injected with 0.2 to 2.7 mg of anthrax toxin into the tail vein. Dissection of dead animals showed signs of acute cyanosis, plethoric organs, pulmonary edema with foci of a telectasis and foamy fluid in the trachea and bronchi which caused the acute, fatal asphyxia. Detailed histologic analysis was reported. In general the microcirculatory processes in these animals were affected with damage to blood vessels, the phenomenon of blood "sludge", edema and ensuring death due to shock or pulmonary-vascular insufficiency. The pathomorphological changes indicated hypo- and anoxia due to microcirculatory problems, diminished oxygen transport function of erythrocytes and pulmonary edema. Vascular and pulmonary insufficiency was accompanied by decreased levels of ATP, characteristic deformation of red blood cells and decreased content of 2,3-diphosphoglycerate in deformed red blood cells. References 10: 8 Russian, 2 Western.

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SOFT CONTACT LENSES FOR SERVICEMEN

Moscow KRASNAYA ZVEZDA in Russian 4 Aug 87 p 4

[Article by V. Volkov, general-major, Medical Corps; Hero of Socialist Labor; chief opthalmologist, USSR Ministry of Defense]

[Abstract] The development of long-wear contact lenses has opened up new opportunities for military service, particularly when the degree of correction required is on the order of three to four diopters. Lenses developed by the Institute of Colloid Chemistry and Water Chemistry of the Ukrainian SSR Academy of Sciences have undergone successful clinical trials conducted by Col. N. Ushakov of the Military Medical Academy imeni S.M Kirov. The lenses were very well tolerated and were worn without problems for two to three months. It is obvious now that in the large majority of cases myopia is no longer an obstacle to military careers for young people, even for those aspiring to be pilots.

12172/12223
CSO: 18400044

NEW DRUG FOR CARDIOVASCULAR DISEASE

Riga NAUKA I TEKHNIKA in Russian No 9, Sep 87 p 9

[Article by A. Veysa]

[Abstract] Excess calcium ions causes muscle cells to contract, while a deficiency causes them to relax. Contraction of blood vessel musculature raises blood pressure; excess cardiac muscle contraction causes oxygen deficit and pain. It has recently been established that various cardiovascular diseases can be treated with calcium ion antagonists. A new drug, Foridon, has been developed at the Institute of Organic Synthesis, LaSSR Academy of Sciences. It is the first calcium ion antagonist of Russian origin and is recommended for industrial production and widespread use in elevated arterial pressure and cardiac ischemia. Foridon has fewer side effects and milder action causes less central nervous system depression and has greater stability than many foreign preparations.

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SYNTHESIS AND ANTICONVULSIVE ACTIVITY OF NOVEL DIBENZO-18-CROWN-6 DERIVATIVES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 4, Apr 87 (manuscript received 10 Apr 86) pp 425-428

[Article by E.I. Ivanov, A.A. Polishchuk, T.L. Karaseva and R. Yu. Ivanova, Physiochemical Institute imeni A.V. Bogatskiy, UkSSR Academy of Sciences Odessa]

[Abstract] Starting with cis- and trans-diaminodibenzo-18-crown-6 compounds, their triazole, imidazole, pyridine and azepine derivatives were synthesized and their UV and IR spectral characteristics were reported. All of these compounds had some anticonvulsive properties in doses of 100 to 150 mb/kg. A 16-66% anticonvulsive effect was noted in animals exposed to subcutaneous administration of corazole and thiosemicarbazide or to electric shock. 2,14- • Dimethyldibenzimidazo[5,6-b; 5-6-k]-18-crown-6 was the most effective compound with an LD_{50} above 400 mg/kg. References 8: 2 Russian, 6 Western.

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UDC 615.276.4.:547.8].015.46.07

IMMUNOTROPIC PROPERTIES OF SYNTHETIC MACROHETEROCYCLIC COMPOUNDS AND THEIR ACYCLIC FRAGMENTS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 4, Apr 87 (manuscript received 20 Nov 85) pp 428-431

[Article by I.E. Britva, T.O. Filippova, N.Ya. Golovenko, Yu.A. Popkov and S.M. Parkhomenko, Odessa University imeni I.I.Mechnikov and Physiochemical Institute imeni A.V. Bogatskiy, UkSSR Academy of Sciences, Odessa]

[Abstract] The relationship between the structure and immmunostimulating activity for a series of macroheterocyclic compounds and their acyclic fragments was investigated. Administration of cyclophosphane led to development of immunodeficiency in experimental mice. Administration of macroheterocyclic compounds (1,13-dimethyl1-4,7,10-tris(p-tolylsulfonyl)-6-oxa-1,4,7,10,13-pentaazacyclooctadecane-2,12-dione and 4,7,10-tris-(p-tolylsulfonyl)-16,19,24-trioxa-1,4,7,10,13-pentaazabicyclo-11,8,5-hexacosane-3,12-dione) led to a partial immunostimulating effect. Noncyclic tosyl group-containing fragments showed a slight but insignificant immunostimulating effect. It was concluded that the immunostimulating effect is due to the cyclic structure and not to the presence of tosyl groups. One possible mechanism could be based on the Ca^{2+} and Mg^{2+} ions forming complexes with macroheterocyclic compounds. References 7: 2 Russian, 5 Western.

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UDC 547.717'898

SYNTHESIS AND PHARMACOLOGICAL STUDY OF POLYFUNCTIONAL MACROHETEROCYCLES. III. SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF SOME NITROGEN- AND SULFUR-CONTAINING MACROCYCLES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 5, May 87 (manuscript received 19 Nov 85) pp 573-575

[Article by M.G. Voronkov, T.I. Malkova, V.I. Knutov and M.K. Butin, Irkutsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences]

[Abstract] Natural macrocyclic antibiotics posses a wide spectrum of antibacterial activity but are very toxic. Searching for synthetic analogs of such macrocyclic compounds, some nitrogen- and sulfur-containing macroheterocycles and open-chain compounds were synthesized and tested for antibacterial activity. In this group of compounds, 1,8-bis-(2-cyanoethylamino)-3,6-dithiaoctane showed the highest activity against E. coli (at 50 μg/ml) followed by 1,8-bis(2-carabomethoxyethylamino)-3,6-dithiaoctane and 2,5-bis-[(N-carbomethoxyethyl)-2-aminoethylthio]-1,3,4-thiodiazole (100 μg/ml dose). 1,4,12,15-Tetrathia-7,9,18-20-tetrakis(2-carbomethoxyethyl)-7,9,18,20-tetraazacyclodocosane, 1,2-benzo-3,14-dioxo-7,10-dithia-4,13-diazacyclotetradeca-1-ene and 7,8 benzo-6,9-dioxo-5,10-bis(2-carbomethoxyethyl)-2,13,17-trithia-5,10-15,16-tetraazabicyclo[12.2.1]-heptadeca-1,4-diene exhibited a weak activity (at 200 μg/ml) against Staphylococcus aureus and E. Coli. References: 6 Russian.

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UDC 615.849.2.015.25:547.822.3].012.1

SYNTHESIS AND INVESTIGATION OF RADIOPROTECTIVE ACTIVITY OF N,N'-DIPIPERIDINOALKYL DIHYDROCHLORIDES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 21, No 6, Jun 87 (manuscript received 23 Dec 85) pp 699-702

[Article by M.I. Yermakova, I.M. Belova, N.I. Latosh, E.A. Tarakhtiy, I.P. Tregubenko and D.I. Semenov, Institute of Chemistry and Institute of Plant and Animal Ecology, Ural Scientific Center, USSR Academy of Sciences, Sverdlovsk]

[Abstract] In the search for new radioprotectors, N,N' dipiperidinoalkyl dihydrochlorides with 2 to 6 carbon atoms in the aliphatic chain were synthesized and their toxicity and radioprotective activity in mice were studied. It was shown that unsubstituted compounds with 3-5 carbon atoms in the aliphatic chain possessed the highest long-lasting radioprotective activity. Introduction of methyl groups into the piperidyl ring reduced this activity regardless of the substitution position. It is proposed that the protective activity is due to alteration of oxidation-reduction processes in the animals evoked by these compounds. References 12: 3 Russian, 9 Western.

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BRAIN BIOPOTENTIALS ASSOCIATED WITH DECISION ABOUT CHOICE OF REACTION

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I.P. PAVLOVA in Russian Vol 37, No 4, Jul-Aug 87 (manuscript received 16 Jan 87) pp 750-752

[Article by A.M. Ivanitskiy, V.B. Strelets, V.P.Kovalev and V.Yu. Novototskiy-Vlasov, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V.P. Serbskiy, Moscow]

[Abstract] Retrograde biopotential summation was used to study subjects who had to choose a reaction among several possibilities in response to stimuli and instructions. In response to a colored light, subjects were to press a specific button with a specific hand or not press a button. Biopotentials were averaged synchronized to stimulus or response or classified according to reaction time. The most pronounced elicited frontal potential had a 160 msec latency with latency peaks of 200-240 msec and 320-400 msec. Posterior associative and occipital potentials were more pronounced than frontal. Reverse summation from response point did not reveal separate biopotentials, indicating that stringent time dependence was connected to stimulus, rather than response. W-form complexes were noted. Biopotential summation in narrow time intervals registered both biopotential components and complex waves. This method gave results which demonstrated the dependence of wave time displacement on response latency. The complex observed is distinct from readiness potentials, indicating that the biopotentials noted are associated with a decision about the type of motor response. Figures 2; references 5: 4 Russian, 1 Western.

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MEASURING FUNCTIONAL FEASIBILITY OF HUMAN VISUAL SYSTEM

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 9, Sep 87 pp 63-72

[Article by Yu.Ye. Shelepin, V.V. Volkov, L.N. Kolesnikova, V.B. Makulov and V.N. Pauk]

[Abstract] The widely-used optotype method for evaluation of vision is unsatisfactory, since multiple measurements and greater accuracy are necessary for modern requirements. Measurement of modulation transmission function can be used, with certain assumptions, to evaluate sensitivity in the entire visual space. Computers can facilitate measurement and interpretation of transmission function. The complex of theoretical concepts, practical methods and devices for measuring information transfer in the entire visual spatial-frequency range has been designated "visuocontrastometry". Various periodic grids, differing in spatial frequency, are used for testing threshold of sensitivity to high, medium or low frequency contrast is a very significant diagnostic finding. Ophthalmologic pathology in the presence of normal visual acuity, such as in glaucoma or amblyopia, is revealed by visuocontrastometry, but not by traditional optotype testing. Computer modeling of distorted spatial frequency fields can indicate that the contrast thresholds differ from letter detection and identification. In order to test recognition, it is necessary to use letter optotypes in which the lower spatial frequencies are absent. Such optotypes, on a gray background, permit more accurate evaluation of visual acuity but must be used with independent evaluation of working range of spatial vision, using various matrices of black and white elements. Results obtained indicate that visuocontrastometry can be used for fundamental physiological investigations, for diagnosis and preventive medicine, for developing functional training methods and for quantitative evaluation of treatment effectiveness. Figures 6; references 4 (Russian).

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INTERNATIONAL HUMAN CARDIAC ARREST AND ITS POSSIBLE MECHANISMS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 104, No 8, Aug 87 (manuscript received 4 Aug 86) pp 133-134

[Article by Yu.R. Sheykh-Zade, S.P. Tsvetkovskiy, I.A. Sadymov, L.V. Georgiyevskiy and V.M. Pokrovskiy, Department of Normal Physiology, Kubanskiy Medical Institute imeni Red Army, Krasnodar]

[Abstract] While reported experimental subject control of heart rhythm is probably accomplished by control of external respiration and/or muscle tone, aided by emotional state, the experience reported here indicates that other methods can also be used. A 33-year old mechanic at the Institute was able to stop his heart for seven seconds, as demonstrated by electrocardiography. This voluntary cardiac arrest was accompanied by skin paleness and general weakness. The subject accomplished the feat in a sitting position after preliminary breath holding on inspiration. In the electrocardiogram, sharp isoline merging was noted, indicating hidden diaphragm movement, though the subject appeared not to move. After the cardiac arrest cardiac contractions were more widely spaced than before. One may conclude that this is vagal cardiac arrest, accomplished via self-irritation of peritoneal receptors. Preliminary breathing arrest, increasing the vagus tone and facilitating voluntary movement of diaphragm muscles, plays an important role. Two of the authors of this article learned to use this procedure to markedly slow cardiac rate; administration of subcutaneous atropine abolished the response. Figures 2; references 9: 3 Russian, 6 Western.

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SERUM LEVELS OF PITUITARY-ADRENOCORTICAL HORMONES IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION TREATED WITH SOVIET HEXAPEPTIDE DELARGIN

Moscow KARDIOLOGIYA in Russian Vol 27, No 9, Sep 87
(manuscript received 12 Jul 85) pp 110-112

[Article by V.D. Slepushkin, Yu.B. Lishmanov, T.V. Fedotova, G.K. Zoloyev, V.G. Mirza and I.V. Maksimov, Laboratory of Pathologic Physiology, Laboratory of Radionuclide Research Methods, Department of Emergency Cardiology, Siberian Branch, All-Union Cardiological Research Center, USSR Academy of Medical Sciences, Tomsk]

[Abstract] The positive effects of dalargin, a Soviet enzyme-resistant hexapapetide analog of leu-enkephalin, in rats with acute myocardial ischemia led to therapeutic trials in 45 patients with acute myocardian infarction. The patients received 1 mg bolus of dalargin intravenously on admission, followed by 1 mg t.i.d. intravenous infusions for 6 days. Dalargin was without effect on the intensity and duration of pain. However, radioimmunoassays showed that in the first post-infarction day dalargin-treated subjects did not show elevation of ACTH and cortisol, as was the case with untreated patients, while the increase in serum levels of aldosterone was less pronounced than in the untreated group. Beginning with the 2nd to the 6th day ACTH levels in the treated cohort were higher than in the control patients, while cortisol and aldosterone levels remained identical in both groups on days 2 and 3, increasing in the treated group on day 6. The effects of dalargin were, therefore, shown to affect the pituitary-adrenocortical system in a manner designed to alleviate the effects of stress on the adrenal cortex, at least in the early stages of a myocardial infarction. Tables 1.

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MEASURES NEEDED TO IMPROVE MEDICAL EQUIPMENT

Moscow IZVESTIYA in Russian 1 Oct 87 p 4

[Article by M. Mamonov, chief engineer, Institute of Surgery imeni A.V. Vishnevskiy, USSR Academy of Medical Sciences: "Restructuring Healthcare: A Nationwide Discussion": first paragraph appears in boldface in source]

[Text] "The equipping of clinics with medical gear is spontaneous and uncontrolled."

Three laboratories conducted an analysis of the blood of one and the same patient. The results came back scandalously different--and none of them were correct. The situation, unfortunately, is not uncommon. Even now, our medical institutions do not have reliable, calibrated, computerized laboratory equipment.

The equipment in scientific research institutes has improved considerably in recent years. But in each case, the director of the medical enterprise, and sometimes even the director of a subunit, has himself decided what would be purchased and where, and where it would be set up and how it would be used, and each has himself "acquired" the means to make the purchase. USSR Ministry of Health officials have failed to note that various types of medical equipment that are expensive to service and to operate are being purchased abroad. This is how the spontaneous and, in point of fact, uncontrolled practice of buying imported medical equipment in single orders, without resolving questions involving its operation and servicing, has come about. At the same time, the proper level of development of state-of-the-art domestic equipment has not taken place.

An indication of what this practice has led to is given by the findings of one of the audits conducted by the USSR Committee of People's Control. Millions of rubles worth of inoperative

imported equipment was found at the sites of this audit alone. it was noted that the poverty of one institution neighbors the wastefulness of another.

A goal is being set to increase the production and procurement of medical equipment in the next five-year plan by a factor of 2.5, and after that by a factor of 3.5, and to attract more enterprises of branches of the defense industry to manufacture it. But as we all know, wishing alone will not develop the new equipment. What needs to be done is to specify the ministries responsible for the development of medical equipment in accordance with their design.

As does any equipment, medical equipment must undergo metrological inspection and metrological certification. But the service organizations capable of carrying out these tasks do not yet exist either. No one is engaged in metrological inspection of diagnostic procedures.

Metrological certification of imported medical equipment, for that matter has yet to be organized. There is much talk now about the fact that diagnostic centers will be set up. But without control of equipment accuracy, they will suffer from the same illness healthcare institutions suffer from--disparity in equipment readings.

What needs to be done first of all is this:

1. Create in the USSR Ministry of Health an administrative agency for equipment with functions and powers like those of similar agencies in the industrial ministries. Staff it with highly qualified engineering personnel.

2. Create in all scientific research institutes that develop medical equipment engineering-and-technical and metrological service organizations. Also set up such organizations in all large health care treatment institutions.

3. Expand the powers of health care institution directors to alter the personnel structure and wages of the engineers who service the equipment.

4. Specify which industrial ministries will be responsible for developing and producing which types of medical equipment. Establish nomenclature, production volumes, and deadlines for them, and designate the necessary labor allocations and limits. Include this equipment in the national economy plans.

5. Create in the USSR Ministry of Health a service organization headed by a chief metrologist, and create a main institute of metrology.

If these pressing problems are not solved, the projected program for manufacturing high-quality medical equipment will remain wishful thinking.

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RESTRUCTURING OF MEDICAL SCIENCES

Moscow IZVESTIYA in Russian 3 Sep 87 p 3

[Interview with V.N. Smirnov, director, Institute of Experimental Cardiology, USSR Academy of Medical Sciences, conducted by S. Tutorskaya]

[Abstract] Bureaucracy, economic inefficiency, and poorly managed medical research establishments have made Soviet medicine a shambles. Such changes and improvements as are being made are hindered by inertia that stems from decades of inaction and the traditional fear of acting independently that has come from long decades of stagnation. The Academy of Medical Sciences has yet to act to set research priorities and differentiate between world-class research and perfunctory tinkering. In addition, because of lack of coordination and cooperation it is virtually impossible to turn discoveries into revenue-earning products, despite the fact that the USSR suffers from shortage of ethical pharmaceuticals. The USSR lags in making AIDS diagnosticums available, again because of lack of coordination, financing, and mismanagement. In many cases the expertise that scientists and medical researchers can provide is underutilized or ignored, to the detriment of Soviet society. Finally, perhaps the time has come to restructure Soviet medical education by placing the independent medical institutes under the auspices of universities.

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RESTRUCTURING OF EMERGENCY CARDIOLOGICAL SERVICES

Moscow IZVESTIYA in Russian 18 Sep 87 p 3

[Interview with A. Golikov, director, Moscow Center for Emergency Cardiology, Scientific Research Institute of Emergency Medicine imeni N.V. Sklifosovskiy, conducted by S. Tutorskaya]

[Abstract] A meaningful restructuring ('perestroyka') of emergency cardiological services would require a comprehensive approach that would improve both the scope and the quality of cardiological care. Additional measures have to be taken to make certain that patients with heart emergencies are delivered to the center by the specialized cardiological ambulances attended by a cardiologist rather than by the general ambulance service, since the outcome of a myocardial infarction is largely dependent on the care received in the early stages of the attack. In addition, the center has to be reorganized to function fully on a round-the-clock basis, and a network of microrayon stations need to be established. Finally, the cardiologists at the center should be paid as well as the cardiologists in the ambulance service. Currently, the center's cardiologists earn 130 to 140 rubles per month, which is two- to three-fold lower than the salaries of their colleagues in the ambulance service.

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RESTRUCTURING OF ONCOLOGICAL SERVICES

Moscow IZVESTIYA in Russian 9 Oct 87 p 3

[Interview with N.N. Trapeznikov, deputy general director, All-Union Oncologic Scientific Center, USSR Academy of Medical Sciences, conducted by S. Tutorskaya]

[Abstract] The biggest obstacle in the restructuring of the Soviet oncological services is bureaucratic inaction, followed by the common sequelae of mismanagement of resources and of available finances. As a result, the USSR lags behind other advanced countries in cancer prevention both in the clinical and the public health sense. Additional problems are presented by the shortage of antineoplastic agents--both Soviet and foreign--and outmoded facilities, equipment and supplies. The educational level and the qualifications of oncologists and other medical personnel are also in need of a careful review, if the Soviet health program is ever to be effective in reducing cancer morbidity.

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HEALTH CARE IN KIRGHIZ SSR

Moscow IZVESTIYA in Russian 30 Sep 87 p 2

[Article by G. Shipitko: "Long-term Construction at Tuya-Ashu Pass"]

[Abstract] The hospital at Tuya-Ashu Pass, 3000 meters above sea level, specializing in the treatment of bronchial asthma and some forms of anemia, is in serious need of repair and renovation. A new building is required in order to provide year-round treatment but construction has been underway for 16 years and is still not completed. This is only one example of many delays in renovation of health facilities in Kirghiz SSR while 25 million rubles of funds allocated for this purpose in the 10th Five-Year Plan were unused and a slightly lesser amount went unused in the past 5 years. The republic has an acute shortage of hospitals, polyclinics, pharmacies and maternity homes and many of the existing ones are in makeshift facilities. A discussion of the state of public health in Kirghiz SSR, conducted at the Presidium of the USSR Supreme Soviet, reported that mortality of children in the first year of life is 1.5 times higher and mortality in the second year of life is almost 3 times higher than the national average. Outbreaks of infectious diseases are frequent. No significant improvement in the situation is seen in the near future. There are areas in which hospitals and polyclinics are situated in makeshift premises, and there is one entire rayon in which there are virtually no medical facilities. There has been some improvement recently, but the situation must change radically in order to provide the needed improvements.

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HEALTH CARE RESTRUCTURING IN MOLDAVIA

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Sep 87 p 3

[Article by A. Pasechnik: "Physician, Heal Thyself"]

[Abstract] The level of cardiovascular, oncological and gastrointestinal diseases in Moldavia has not decreased while child mortality and traumatism has remained high. There has been little improvement in control of drunkeness and drug addiction. Annual payment for medical certificates exceeds 80 million rubles. A project of the Central Committee CPSU and the Council of Ministers USSR "Basic Trends of Development of Health Protection and Restructuring of Public Health in the USSR in the 12th Five-Year Plan and in the Period Up To 2000" discussed means of alleviating this situation. The project emphasizes the importance of preventive health care and this problem is especially important in Moldavia. The hazard from the worsening ecological setting of the republic, aggravated by widespread and sometimes uncontrolled use of pesticides, was emphasized. The material and technical base of public health in Moldavia must be improved since medical institutions in Moldavia are ill housed, poorly equipped and in constant need of repair. A questionnaire conducted in Novaya Aran showed that 50 percent of the citizens complain of the unscrupulous attitude of physicians toward their patients and 33 percent complain of rudeness and lack of tact of medical workers. Doctors have been found guilty of bribe-taking, drunkeness, abuse of their official position and other transgressions. Checks have shown that some advanced students in Moldavia cannot do simple blood analyses or read an electrocardiogram. For some certified physicians, the EKG is as mysterious Chinese writing. Health care reconstruction is still proceeding slowly and resolute and vigorous measures are required to change the situation.

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REASONS FOR DRUG SHORTAGES IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 13 Aug 87 p 4

[Interview with Murman G. Geogadze, chairman, Main Pharmaceutical Administration, Georgian SSR Ministry of Health, conducted by Ketevan Amiredzhibi]

[Abstract] Many factors enter into the problem of drug shortage in Georgia, including inadequate funding, mismanagement of available resources, and malfeasance on the part of the pharmaceutical and pharmacy personnel. In Tbilisi, for example, only some fifteen percent of the prescriptions are for Soviet drugs, due largely to unfamiliarity of physicians with the Soviet drug armamentarium. Improvements in drug availability and patient satisfaction must rest on rectification of existing shortcomings, as well as on educational and disciplinary measures designed to instill a sense of professionalism and responsibility in pharmacists and management. The process of democratization and restructuring now underway in the USSR requires that health workers respond with serious determination to make these programs work.

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MOBILE POLYCLINICS IN RURAL AREAS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Sep 87 p 3

[Article by M. Lutsenko, director, Scientific Research Institute of Physiology and Pathology of Respiration, Siberian Department, USSR Academy of Medical Sciences, Blagoveshchensk: "Polyclinics on Wheels"]

[Abstract] The main problem in the public health service is its rigid structure, permitting no flexibility. Medical service in the Far East and Transbaykal territory is not adequate because of the low population density. To solve this problem, mobile consultation polyclinics were organized and equipped with contemporary diagnostic and therapeutic equipment. In one year of its operation, incapacitation due to respiratory diseases dropped by 30% in the Tambovsk Rayon of the Amur Oblast. Mobile polyclinics take over annual physical examinations, relieving the workload on the central hospital staff. The number of potential patients is about 6-7 times higher than that visiting the hospitals, most patients suffering without medical help until it is too late. The polyclinic network should be enlarged, and pediatric units should be developed. Mobile clinics should be the first contact points for a scattered patient population. Unfortunately, production of suitable vehicles is very limited; this situation must be corrected to increase the number of such mobile units.

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MOBILE DIAGNOSTIC UNITS NEEDED

Minsk SELSKAYA GAZETA in Russian 24 Sep 87 p 2

[Article by T. Pantyushenko, director, Surgical Division, Scientific Research Institute on Oncology and Medical Radiology, BSSR Ministry of Health and P. Mikhalevich, chief physician, Minsk Rayon: "As Shown by Experiment..."]

[Abstract] The diagnostic service in cities is adequate for timely detection of many diseases. Out in the country, this is not the case, especially since many patients show up at the medical centers with advanced stages of diseases and the staff is not always capable of making proper diagnoses for diseases treated only in specialty centers. In the Minsk area, only 147 women aged 30 and older were examined prophylactically out of 855 eligibles. The principal reasons for poor medical service in rural areas are: 1) inability to make proper diagnoses of more complicated diseases on the local level; 2) lack of modern equipment required and 3) lack of awareness among the population for the need for such examinations. For example, the incidence of far advanced cancers has not changed in the last decade. A comprehensive health screening was initiated in Minsk Rayon. In two weeks 556 women were examined in the Ostroshitsko-Gorodotsk medical sector alone, and seventeen cases of mastopathy were detected, the same number found in the entire Minsk Rayon during 1985. This is an effective way accessible to all workers without creating absenteeism. The examinations are performed by mobile units. The only problem is the lack of available specialty vehicles. Their production must be intensified.

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KURGAN CENTER FOR TRAUMATOLOGY AND ORTHOPEDICS

Moscow NEDELYA in Russian No 40, 5-11 Oct 87 p 4

[Article by Valeriy Gavrish: "Kurgan Scientific Center"]

[Abstract] The Politburo of the Central Committee CPSU has adopted a decision concerning the organization of an All-Union Scientific Center "Restorative Traumatology and Orthopedy" at the site of the Kurgan Scientific Research Institute of Experimental Orthopedy and Traumatology. Vladimir Ivanovich Shevtsov, director of the Kurgan Scientific Research Center, discussed the future center. He described it as the largest center of its kind in the world, with a hospital with 800 beds, the latest equipment and highly qualified personnel, including more than 500 persons with 233 associates occupied directly in scientific work. A fundamentally new treatment developed by G.A. Ilizarov is used at the center in many areas of medicine such as neurosurgery, oncology, angiology and dentistry and has been introduced into more than 1000 medical institutes. More than 300 specialists are trained annually at the Institute. The Ilizarov method is being studied and used in many countries. The center includes the main scientific research center and 10 branches in Moscow Oblast, Leningrad, Vladivostok, Volgograd, Kazan, Krasnodar, Krasnoyarsk, Omsk, Sverdlovsk and Ufa. Each branch will have a 300 bed clinic, an outpatient rehabilitation center with a hotel with 300 units, 240 apartments for service personnel and a kindergarten. A general director will head the center while a unified scientific council heads scientific research. The only other such center is the Center of Eye Microsurgery in Moscow. Completion of the center is expected in 1991.

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HYPNOSIS -- POSSIBLE APPLICATIONS FOR COSMONAUTS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Aug 87
p 4

[Article by M. Dmitruk]

[Abstract] Hypnosis can change a subject's perception of time passage and consequent productivity. Physical and metabolic acceleration and deceleration accompanied perceptual changes observed in experiments conducted by Leonid Grimak M.D., while fatigue levels were reduced or increased. Experiments performed by the psychotherapist V. Raykov indicate that hypnotic suggestion can also improve intellectual performance and creativity. While subjects with accelerated time perception exhibited behavior similar to psychosis, those with decelerated time perception resembled depressives. Decelerated time perception via hypnotism may be useful for cosmonauts in interplanetary flight and for training future cosmonauts. Since weightlessness may last for a month, it may be possible to suggest the perception of gravity during weightless interplanetary flight. Hypnosis also has applications in training and self-training; many recently-developed methods for controlling the psyche have elements of hypnosis. Hypnosis can sharply increase work efficiency, liberate personality, develop talent and elicit inspiration.

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TRAINING IN TIME INTERVAL DISCRIMINATION USING VERBAL FEEDBACK

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I.P. PAVLOVA in Russian Vol 37, No 3, May-Jun 87 (manuscript received 18 Jun 86) pp 408-413

[Article by O.I. Ivashchenko and T.N. Reshchikova, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V.P. Serbskiy, Moscow]

[Abstract] Hemispheric differences in reaction time, microinterval evaluation and influence of positive and negative reinforcement were studied in five males and ten females, all 22 to 29 years old, right-handed, with normal or corrected vision. Subjects were instructed to compare the interval between two appearances of illuminated bands on a screen to a standard interval. Test intervals were 10, 60 and 180 msec, standard interval 60 msec. Trifactorial dispersion analysis of correct responses indicated that a 10 msec interval was correctly evaluated in 55-60% of the initial trials, while a 180 msec interval was correctly evaluated in 75-80%. The shorter interval was more accurately evaluated when stimuli were presented to the right side of the visual field; the longer interval was better evaluated by the left side of the visual field. With repetition the number of correct responses increased logarithmically for both intervals independent of visual presentation. Reaction time was 100-200 msec greater for correct evaluation of the shorter interval. For the longer interval, reaction time was 55 msec less for left side stimulus presentation, while for the shorter interval reaction time was not affected by stimulus direction. Reaction time decreased with repetition. Projection of the word "good" after a correct response increased subsequent response accuracy by 10% compared to projection of the word "error" after an incorrect response. Reinforcement did not affect reaction time. The results indicate that the 10 msec interval is more accurately evaluated by the left hemisphere of the brain, confirming the previously-reported "speech" mechanism for evaluating

intervals up to 50 msec. The 180 msec interval was better evaluated by the right hemisphere, indicating a holistic, group-perception mechanism. Negative reinforcement is accompanied by processes, such as error identification, which worsen subsequent performance. Figures 4; references 8: 3 Russian, 5 Western.

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EFFICIENCY OF HUMAN WORKERS AND MEANS TO INCREASE IT

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 8, No 3, May-Jun 87 pp 107-117

[Article by V.A. Bodrov, Moscow]

[Abstract] Concepts of human work efficiency emphasize either the functional possibilities of the human organism or work productivity. Work productivity is affected by worker physical state, emotional state and professional preparation. Methods for measuring productivity are classified as primary (professional) or indirect (functional). Primary methods characterize work effectiveness and reliability, either in real work or test situations. Indirect methods consider the present functional state of the organism and its reserves. Work efficiency may be improved by periodic medical and psychological reviews, optimization of working conditions and direct action at the level of the individual by regulation of professional activity, active recreation, physical preparation, psychogenic, physiological-hygienic, electrophysiological, pharmacological and physical means. Such procedures have been used to improve airplane pilot performance. Autogenic training has been successfully employed in several areas, such as relaxation training. Music is also an effective psychogenic technique. Electrostimulation of nerves and muscles is recommended to reduce discomfort during prolonged activity, but can also increase intellectual capacity. Electroanalgesia and stimulation of biologically active points can also be used. Available pharmaceuticals for improving work efficiency include psychoanaleptics, stimulants, psychoenergizers, actoprotectors substances which suppress the influence of adverse factors and adaptogens. Thus the concept of work efficiency reflects the social and biological character of this fundamental system and provides means for its control and correction. References 42 (Russian).

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VETERINARY TREATMENT IN THE AREA OF A CHEMICAL STRIKE

Moscow VOYENNYYE ZNANIYA in Russian No 2, Feb 86 p 5

["Veterinary Treatment in the Area of a Chemical Strike. (Theme 102). Methodological Instructions"]

[Text] An exercise on the topic "Organization of veterinary processing and treatment of affected animals in the area of a chemical strike" takes 3 hours to conduct. The leader of the exercise is the chief of the service of animal and plant protection in the target area. The trainees are veterinary specialists and zootechnicians of the kolkhoz (sovkhoz), including leaders of teams, departments, links, and brigades, and heads of livestock farms and departments. It is a good idea to assign one division of the animal protection team of the kolkhoz (sovkhoz), consisting of 13-15 individuals, to assist the leader.

The method of the exercise is discussion by the instructor, accompanied by demonstration of the individual elements, with subsequent practical work carried out by the trainees.

In preparation, the leader acquaints the assistants at the site of veterinary treatment with the procedure of their actions during the course of the exercises. Trainees are assigned to their stations and their duties defined in advance.

It is recommended that the exercise be carried out during the warm part of the year, on a previously prepared site on the territory of a livestock farm or on a civil defense training ground. Facilities for processing, run-throughs and control must be set up in this place; there must be pens for confining the animals affected by the toxic substances and for the unaffected ones. The following things are needed: shelving for decontamination of livestock-care objects; a place to prepare solutions, with the necessary quantity of containers and a supply of water; a place for rendering veterinary care, outfitted with a tethering-post or fixed stall with a table for the physician, and supplies of antidotes, drugs, and other materials. Also needed are the following: places to store decontaminants and protective clothing; an area adapted for unloading and loading the animals onto transportation devices; and a place where sanitary processing of personnel can be carried out. In order to carry off contaminated liquid, the site is fitted out with small gutters which culminate in cesspools.

Material-technical supplies: two machines--Komarov disinfection units (KDU) or sanitary disinfection laboratories (SDL), with sets of hoses, collectors, and brush-shower kits. The civil defense division is fitted out with specialized materials in accordance with the catalogue of equipment for work in the area of a chemical strike. About 10-15 head of cattle (calves) or horses are allocated for the exercise.

The leader sets the trainees the task of carrying out veterinary processing and rendering treatment to the animals injured by toxic substances. The trainees should get practice in organizing the sorting of affected animals, rendering them first aid, preparing decontaminating solutions and technical facilities, and in determining the order for slaughtering suffering animals. They must also master safety measures used in carrying out the work.

The personnel in the division of the animal protection team which is assisting the leader are clothed as for actions in an area of a chemical strike (light protective suit, gas masks, rubber boots and gloves).

The trainees are clothed in dark cotton overalls, with rubberized aprons and oversleeves, in rubber boots and gloves, with gas masks.

The exercise begins in a specialized site. The individuals gathered there are acquainted with the methods of treating animals affected by toxic substances. They are informed that it may be carried out by the dry method and the wet method.

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STUDY OF CONDITIONS FOR EFFECTIVE ANTIBODY BINDING WITH HIV PROTEIN IN WESTERN BLOT TECHNIQUE

Moscow VOPROSY VIRUSOLOGII in Russian Vol 32, No 4, Jul-Aug 87 (Manuscript received 19 Mar 87) pp 432-437

[Article by V.E. Berezin, V.M. Zaydes and V.M. Zhdanov, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Further investigations were conducted to increase the sensitivity of the Western blot method for confirming HIV presence. Additional incubation at four degrees Centigrade for eighteen hours, after two hours at thirty-seven degrees Centigrade, increased the intensity of specific antibody binding to HIV proteins, particularly p65 and p34. Two antisera with the same titer at a 1:100 dilution gave different responses when diluted 1:2500. Using strain HTA-4.I, antibodies to gb41 and p55/53 were detected most often, while p17 and gp120 were detected least often. Using strain HTA-4.II, gp120, pp55/53 and p24 were frequently detected, and p17 rarely. The results obtained indicate the importance of incubation time and conditions and choice of antiserum and dilution for success with the Western blot method. While the current assumption that HIV strains present in the population possess sufficient immunological homology with the prototype strain used for testing appears adequate, one must not assume that this will always be the case. Criteria for a positive Western blot test should usually specify detection of at least four HIV proteins, however three of 24 positive sera demonstrated marked differences in strain response. This may require alteration of criteria if further variability develops in the future. It is advisable to use test systems containing various viral antigenic variants when testing sera for HIV antibodies. Figures 3; references 27: 3 Russian, 24 Western.

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PATHOGENIC MACHUPO AND LASSA ARENAVIRUSES; BIOCHEMICAL CHARACTERISTICS OF VIRION RNA AND PROTEIN

Moscow VOPROSY VIRUSOLOGII in Russian Vol 32, No 4, Jul-Aug 87 (manuscript received 15 Jan 86) pp 473-480

[Article by I.S. Lukashevich, N.N. Lemeshko, T.A. Stelmakh, V.P. Golubev and Ye.P. Scheslenok, Belorussian Scientific Research Institute of Epidemiology and Microbiology, Minsk]

[Abstract] Sucrose isodensity gradients were used to purify Machupo and Lassa whole virus, RNA and protein. Purified Lassa and Machupo virus had a density of 1.16-1.19 g/cubic centimeter. The purified virus had an infectivity up to 10% greater than the starting material. RNA-RNA hybridization with excess poly(A) showed substantial hybridization with the 22-24S segment and less with the 28-31S segment. The results indicate that virus-specific sequences are localized in the two segments hybridized. Inhibition of cellular rRNA synthesis with actinomycin D and use of tritiated uridine gave labeling in the 30-31S and 22-24S RNA segments, further confirming that these segments are parts of the viral genome. Heat denaturation did not change the level of RNase resistance, indicating a higher concentration of virus-specific material. The two segments possess complimentarity. Low-temperature self-annealing of the smaller segment was directly proportional to RNA concentration, indicating that the complementarity of RNA is a characteristic property of paramyxoviruses. High-performance gel permeation liquid chromatography gave effective separation of various viral proteins. Pulse-chase labeling indicated that there is a precursor-product metabolic link between the 78 kdal and 37 kdal Machupo proteins. Results obtained with carbon-14-labeled amino acids suggest that the 60 kdal Lassa protein is the major protein component of the nucleocapsid. Figures 6; references 19: 3 Russian, 16 Western.

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BIOLOGICAL PROPERTIES AND STRUCTURE OF RECOMBINANT GENOMES OF ECTROMELIA AND RABBIT POX VIRUSES

Bratislava ACTA VIROLOGICA in Russian Vol 31, No 3, May 87
(manuscript received 13 Jun 86; in final form 23 Oct 86)
pp 193-202

[Article by V.I. Chernos, T.G. Senkevich, N.V. Chelyapov, T.P.Antonova, T.S. Vovk and I.V. Mitina, Moscow Scientific Research Institute of Viral Preparations, USSR Ministry of Health]

[Abstract] Infection of chick embryonic fibroblasts with ectromelia (mouse pox) virus and rabbit pox DNA, the latter cleaved into two fragments by SmaI restrictase, resulted in isolation of recombinant forms possessing features of both parental strains. Certain recombinants that induced specific rabbit pox-type lesions on intradermal injection in rabbits also induced ectromelia-type lesions on injection into mouse footpads. Analysis of DNA fragments derived from the recombinants also demonstrated that some recombinants multiplied to high titers in mouse foodpads without eliciting typical ectromelia-like lesions. The restriction studies on the recombinant DNA molecules demonstrated that they consisted of rabbit pox DNA sequences with small insertions of ectromelia DNA. Detailed analysis and mapping of the locations of these insertions should facilitate an understanding of the pathogenicity determinant of ectromelia. Figures 4; tables 2; references 26: 5 Russian, 21 Western.

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